

REMARKS

The Examiner has rejected claims 1-15 under 35 USC 101 ad directed to non statutory subject matter. The Examiner states:

5 "When nonfunctional descriptive matter is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement."

10 Section 35 USC Section101 is designed to prevent patenting non functional subject matter that has no practical utility. MPEP section 2106.6 discusses this requirement in the context of computer-related inventions. It states (emphasis mine):

2106.01 **>Computer-Related Nonstatutory Subject Matter< [R-5]

15 Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993.) "Nonfunctional descriptive material" includes but is not limited to music, literary works, and a compilation or mere arrangement of data.

25 Both types of "descriptive material" are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)(discussing patentable weight of data structure limitations in the context of a statutory claim to a data structure stored on a computer readable medium that increases computer efficiency) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory).

35 When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 40 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were

unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). Such a result would exalt form over substance. *In re Sarkar*, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.") (quoted with approval in *Abele*, 684 F.2d at 907, 214 USPQ at 687). See also *In re Johnson*, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus, nonstatutory music is not a computer component, and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory and should be rejected under 35 U.S.C. 101. In addition, USPTO personnel should inquire whether there should be a rejection under 35 U.S.C. 102 or 103. USPTO personnel should determine whether the claimed nonfunctional descriptive material be given patentable weight. USPTO personnel must consider all claim limitations when determining patentability of an invention over the prior art. *In re Gulack*, 703 F.2d 1381, 1385, 217 USPQ 401, 403-04 (Fed. Cir. 1983).

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I. FUNCTIONAL DESCRIPTIVE MATERIAL: "DATA STRUCTURES" REPRESENTING DESCRIPTIVE MATERIAL *PER SE* OR COMPUTER PROGRAMS REPRESENTING COMPUTER LISTINGS *PER SE*

Similarly, computer programs claimed as computer listings *per se*, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material *per se* from claims that define statutory inventions.

Computer programs are often recited as part of a claim. USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer

program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material *per se* and hence nonstatutory.

5 Since a computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process and USPTO personnel should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as nonstatutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, USPTO personnel should treat the claim as a process claim. See paragraph IV.B.2(b), below. When a computer program is recited in conjunction with a physical structure, such as a computer memory, USPTO personnel should treat the claim as a product claim. See paragraph
10 IV.B.2(a), below.
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Clearly then a computer program which is programmed into a computer and controls the computer to carry out a process (other than a pure mathematical algorithm) is statutory subject matter. To eliminate any possibility of an argument regarding the process of
20 Claim 1 being nonstatutory, the claim has been amended to clarify that it is comprised of process steps carried out on a computer. Also amendments have been made to clarify that the generation of two certification registration lists is such that a second certificate registration list is generated in a second act. The acts of generating the two certificate registration lists can be simultaneous. But the act of generating the first certificate
25 registration list is a separate act from the act of generating the second certificate registration list, and the validity periods are at least partially consecutive with the beginning of the validity period of the second certificate registration list being at a future point in time. All these acts are performed by a computer, so claim 1 is statutory.

Other amendments were made to the dependent claims to conform them to the
30 new structure of claim 1.

Independent claim 8 was a means plus function apparatus claim as were its dependent claims 9-11. The means plus function language has been removed so as to specify an apparatus programmed in a particular way to carry out the process specified in these claims. A computer programmed to carry out a process is not non statutory
35 subject matter and these claims have been amended to include a computer programmed with software which controls it to carry out the recited function.

A new means plus function claim 31 has been added to cover all the embodiments taught in the specification involving CRLs of the second and third type such as those taught at pages 6 and 7 of the specification.

As to independent claim 12, the claim has been amended in the preamble to put it into proper statutory form as the type of claim approved in *In re Beauregard*. . Since such claims are structured to claim the process steps that the computer program code stored on the computer-readable medium controls the computer to perform, the means plus function language was removed from claim 12 and its dependent claims and the claims have been rewritten to claim process steps.

5 **THE ANTICIPATION REJECTION**

The Examiner rejected claims 1-15 as anticipated under 35 USC 102 by applicant's admissions against prior art. The Examiner characterized the invention as 10 "advance production of certificate lists" and characterized the limitations in claims 1, 8 and 12 reciting "at least partially consecutive validity periods" as the limitations that "deal with this advance production". As to claims 2-7, 9-11 and 13-15, the Examiner referred to the limitations "at least partially consecutive validity periods" as the limitations which "refer to the advance production of certificate lists."

15 An anticipation rejection is proper only if a single prior art reference discloses every limitation recited in the claim.

MPEP Section 2131 states:

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20 **TO ANTICIPATE A CLAIM, THE REFERENCE
MUST TEACH EVERY ELEMENT OF THE CLAIM**

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." 25 *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ... "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 30 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim....

30 The Examiner stated that the undersigned admitted in the arguments filed with the amendment of May 2007 that the claim limitation "partially consecutive validity periods" includes non-overlapping validity periods. That is not exactly correct. What the applicants said in the argument quoted below is that the limitation "partially consecutive validity periods" includes both overlapping validity periods and non overlapping validity 35 periods with no gaps (in other words, the beginning of the validity period of a

second list is coincident in time with the end of the validity period of the first list).

What the undersigned said in the argument in the May 2007 amendment was:

5 Webster's 7th Collegiate Dictionary defines "consecutive" as "following one after the other in order without gaps: continuous." As applied to the validity periods, this would mean that there would be no gaps between the end of one validity period and the start of the next one. That however does not mean that there cannot be overlap between validity periods.

10 The specification teaches at page 8, lines 8-10 that the validity periods must be "at least partially consecutive" and that the beginning of the validity period of at least one of the validity periods must be at some future point in time. The specification goes on to teach that publishing of each certificate revocation list occurs one at a time *essentially at the time of the beginning of the validity period*. That suggests to one of skill in the art understanding the need for security and the purpose of these lists is that there should be no gaps between publication of the lists but that the validity periods can overlap and that the publication of a second list occurs at or before the expiration of a first list but need not be exactly at the beginning of the validity period of the second list. This is reasonably clear and is sufficient to meet the needs of the statute. Such a meaning is
15 not inconsistent with the dictionary definition of consecutive because there are no gaps and the lists are published consecutively, one at a time, each essentially at the beginning of its validity period and at or before the expiration of the validity period of a first list. Therefore, the meaning of "at least partially consecutive validity periods" is reasonably clear from the specification as is as precise as the terminology permits. Use of the term "consecutive" alone would be possibly too narrow because a court might interpret that term as requiring the beginning of the validity period of the second list be exactly at the end of the validity period of the first list, a situation which is acceptable but which is not the only acceptable
20 situation. Overlap in the validity periods is allowed also. But to use the term "overlapping" alone would also be too narrow because it would be interpreted to preclude non-overlapping validity periods where the beginning of the validity period of the second list had to be exactly at the end of the validity period of the first list. That too would be too narrow.
25 Accordingly, the undersigned submits that the term "at least partially consecutive" is as clear as the terminology permits given the scope of the invention and its meaning is reasonably clear from the specification which clarifies that the term "consecutive" is being modified from its ordinary meaning (more to make clear what is implicit in the ordinary definition) in such a way as to include overlapping but not preclude non-overlapping
30 with no gaps.

35 The Examiner stated that this was an admission that the point applicants are asserting as the point of novelty of the invention is actually prior art because prior art
40 revocation lists do not need to be generated long before the validity period. This statement does not make much sense. Why? Because the applicant's stated in the summary of the invention at page 5, lines 19 et seq. that the object of the invention was

to reduce the practical work needed to produce and distribute certificate revocation lists from the root CA by producing IN ADVANCE a plurality of CRLs of the first type (meaning they do not indicate any CA in revoked status) with their validity periods forming a sequence in time (the validity periods can be partially overlapping but there must be no gaps). Then these pregenerated CRLs of the "first type" are issued in sequence if there have been no security breaches on the concerned sub CAs that have been observed. In other words, the CRLs of the first type are generated in advance with a private key which is only needed when they are generated and each CRL of the first type has a different validity period that begins in the future. If the security has not been breached (all CAs still secure) by the time the validity period of the next CRL of the first type in the sequence starts, the CRL of the first type can be issued immediately without the need for obtaining the private key or generation of a new CRL. In some embodiments, if security has been breached, the pregenerated CRL of the first type which is next to be published is discarded and a new CRL of a second type (meaning it indicates one or more CAs are in revoked status) is generated by obtaining a private key and published instead of the CRL of the first type. This saves time and eliminates the need to obtain a private key each time in the future when a new CRL of the first type is to be issued. In an alternative embodiment, multiple CRLs of the second type can be generated in advance, each indicating a revoked status for one or more CAs. Then, when a security breach of a CA is detected, the appropriate CRL of the second type which has been pregenerated can be selected depending upon which CA has had its security breached, and immediately published thereby saving the time needed to generate a new CRL indicating the security breach of some particular CA.

More precisely, the Examiner opined that the novel feature of the invention relates to the phrase "at least partially consecutive validity periods". This is not correct. The issue of overlapping or non-overlapping validity periods is not of particular importance in view of the inventive merits of the application, other than in defining that there shall be no gaps between successive validity periods.

To correctly understand the invention, it is important to understand that generation of certificate revocation lists before the actual validity period begins addresses a problem in that during normal operations, the private key needed to sign a newly generated certificate revocation list is not available. After pre-generation, a certificate revocation list is kept safe and not published before the validity period starts, or is about to start. Therefore, in the invention, if no changes, for example revocation of

certificates, are needed, then the pregenerated certificate revocation list is published at a future point in time. If, on the other hand, new certificates need to be added on the certificate revocation list prior to publication thereof, the pre-generated certificate revocation list is deleted and a new certificate revocation list is generated. A private key 5 of the certification authority must then, but only then, be made available for the newly generated certificate revocation list. In some embodiments, as mentioned above, CRLs of the second type are generated in advance and selected for publication on the basis of for which CA there has been a breach.

In a nutshell this means that a private key is only needed when the certificate 10 revocation list is prepared and again upon generation of a new, replacement certificate revocation list. If there are no new revocations, all pre-generated certificate revocation lists of a first type can be published at the time they become valid, i.e., in a future point of time. No private key is needed at this future point of time since the stored certificate revocation list has not been altered in any way since its formation and authorization.

15 This is not disclosed nor is it suggested in pages 1-5 of the present applicaton on in the cited Cisco discussion. In some embodiments, CRLs of the second type (indicating a revoked status for one or more CAs) are generated in advance also, and the appropriate CRL of the second type for the CA that has been compromised is picked for publication at the beginning of that CRL's validity period.

20 Advance production of a plurality of certificate revocation lists, the validity period of the certificate revocation lists forming a sequence and issuing one of these pre-generated certificate revocation lists at a future point in time if no security breaches have been observed does not appear to have been disclosed or suggested by prior art.

The feature of claim 1 "where the beginning of the validity period of at least one 25 of said at least two certificate revocation lists of a first type is a future point in time" is therefore clearly new over the prior art. As explained above, this brings a clear advantage over the prior art. For example, the exchange of private keys is only needed when the certificate revocation list is pre-generated and whenever a new certificate revocation takes place, but the exchange of keys is not necessary when such a list is 30 taken into use. Pages 6 and 7 of the specification list several other advanatages obtainable by the invention.

New claims 16 through 20 are intended to cover embodiments where a sequence of CRLs of a second type is generated in advance for each sub CA so that when the security of one is breached, the pre-generated CRL of the first type can be discarded

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and a CRL of the second type indicating a revoked status of the compromised sub-CA can be published instead. Dependent claims 17-20 cover the embodiments taught at page 6, lines 18-27.

5 New claims 21 through 25 cover the embodiment where CRLs of the second type are not generated in advance but are generated when a security breach of a sub-CA has been detected. Dependent claims 22-25 cover the embodiments taught at page 6, lines 18-27.

New claims 26 covers the embodiment at page 6, line 35 to page 7, line 3.

Dependent claims 27-30 cover the embodiments taught at page 6, lines 18-27.

10 The courtesy of a telephone interview is requested if these remarks and amendments do not place the case in condition for allowance.

Respectfully submitted,

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Ronald C. Fish

Ronald Craig Fish
Reg. No. 28,843
Tel 408 866 4777
FAX 408 866 4785
RCFIPLAW@COMCAST.NET

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25 P.O. Box 1450, Alexandria, Va. 22313-1450.
on 11/14/07
(Date of Deposit)

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Ronald C. Fish

Ronald Craig Fish, President
Ronald Craig Fish, a Law Corporation

Reg. No. 28,843